

Triple registers.....	166
Barographs.....	202
Thermographs.....	165
Tele-thermographs.....	8
Tipping-bucket rain gages.....	152
Electrical sunshine recorders.....	144
Photographic sunshine recorders.....	15

With one or two exceptions the stations that are not at present completely equipped are of slight importance, and, in general, have all the instruments necessary to the satisfactory performance of their work.

EQUIPMENT OF STORM-WARNING STATIONS.

The equipment of 26 selected stations with storm-warning towers and improved high-power lanterns was undertaken at the beginning of the year. The funds available for this were limited, and notwithstanding the fact that a considerable amount of other work was taken up, including the installation of an exceptionally high tower (115 feet) at the Delaware Breakwater, Delaware, nearly all have been brought to a very satisfactory state of completion.

Almost a year is required in work of this kind, for the reasons that owing to the special nature of the towers, lanterns, etc., they are not carried in stock by contractors, but require to be manufactured after orders are placed, viz, after the beginning of the fiscal year. From sixty to ninety days are required for this purpose, and the shipment of towers to stations, the locations of which are often relatively inaccessible, consumes additional time. During this interim leases and other arrangements are made for title to the site of the towers, and bids for their erection and the installation of lights are obtained. Owing to the severity of the winters in the Lake regions it is necessary, in certain cases, to defer until springtime the erection and installation of towers and lanterns planned for during the winter.

At the close of business June 30, 149 steel towers, with improved auxiliary equipment, had been installed at as many stations distributed over the shores of the Great Lakes and the Atlantic and Pacific seacoasts.

High-power electric lanterns are installed at 77 stations, and improved oil lights at 68 stations. The towers at 3 stations are used for flag displays only.

The present plans contemplate the equipment of 10 additional stations, supplies for which have been ordered.

EXPOSITION WORK.

The preparation of the exhibit to be made by the Weather Bureau at St. Louis was actively taken up by the professor in charge of the instrument division, and practically all the apparatus and material required was boxed and ready for shipment February 1, 1904. Shipment was made a few days thereafter, and additional supplies, consisting of a special glass weather map, swinging chart frames (clusters), instrument cases, etc., were forwarded from Detroit, Mich. Nothing was injured or delayed in any way in transit. The work of installation began promptly on April 6 and was completed on April 29, the day before the opening, with the exception of the charging of the storage batteries and the installation of a special automatic card-printing press. The shipment of the latter had been unavoidably delayed, and the wiring of the building for electric current had not been completed. These deficiencies were supplied, however, in the course of a few weeks, and the exhibit was turned over to Mr. E. H. Bowie, in charge of the station at St. Louis, on May 21.

TELEGRAPH SERVICE.

TELEGRAPHIC REPORTS.

To meet as far as possible the pressing demands for a wider distribution of the daily telegraphic reports of observations, arrangements were perfected at the close of the year for a very generous increase in the number of such reports telegraphed over circuits or as special messages, to go into effect on July

1, 1904; including the establishment of a new circuit between Fort Worth, Tex., and St. Louis, Mo., with intermediate stations at Oklahoma, Okla., Wichita and Kansas City, Kans., and Hannibal, Mo. While for economic reasons it is impracticable to satisfy all demands in this respect, it is believed that the present distribution of reports, resulting in a much more comprehensive display of weather conditions on the maps and bulletins issued at stations, will give general satisfaction, both to the public and to the officials charged with making district or local forecasts.

The services rendered by the principal telegraph companies in collecting and distributing the reports of observations and in telegraphing the daily forecast messages from the several district centers were as a rule, prompt and efficient. Complaints of delays, errors, and other irregularities, when brought to the notice of the proper telegraph officials, received prompt attention and corrective action.

TELEGRAPH AND TELEPHONE LINES.

A new 3-conductor submarine telegraph cable was laid from the mainland to Block Island, R. I., a distance of eleven miles, on September 3, 1903. Preparations are now under way for laying submarine cables from near Nags Head to Manteo (Roanoke Island), N. C., from South Manitou to North Manitou Island, Lake Michigan, and from Flavel, Oreg., across the mouth of the Columbia River, to Fort Canby, Wash. All of these, it is expected, will be in operation within the next few months.

No old lines were abandoned or new ones built during the year.

The total receipts from commercial telegrams sent over Weather Bureau lines were \$4,669.35, of which amount \$2,337.33 was for United States tolls and was covered into the Treasury, and \$2,332.02 was paid over to connecting commercial lines.

VESSEL REPORTS.

The reorganization, at the beginning of the year, of the vessel and wreck reporting service of the Weather Bureau, with additional stations at Sand Key, Fla., and Southeast Farallon, Cal., has largely added to the effectiveness of this popular feature of the Bureau, and has been much appreciated by maritime interests generally. Vessel and wreck reports are now furnished free of all charges, except for telegraph tolls over commercial lines, to all corporations and individuals who may apply for them. The average number of vessels reported per month from each designated station was as follows: Cape Henry, Va., 1000; Jupiter, Fla., 57; Sand Key, Fla., 87; Point Reyes Light, Cal., 80; Southeast Farallon, Cal., 25; North Head, Wash., 112, and Tatoosh Island, Wash., 264.

Besides reporting passing vessels, these stations rendered important services in connection with wrecks and other maritime disasters. A brief account of the more striking cases follows:

On October 28, 1903, the schooner *Wempe Bros.* was wrecked on Bonilla Point, Vancouver Island. The Weather Bureau observer at Tatoosh Island telegraphed for assistance, which arrived in time to save the crew, but the vessel proved a total loss.

The U. S. torpedo boat *Moccasin* went ashore near Currituck Inlet, North Carolina, December 3, 1903. The Weather Bureau repairman at that point immediately opened a wreck station on the beach and put himself in direct telegraphic communication with the commandant's office at the Norfolk Navy-Yard, to convey all information and instructions to and from the scene of the wreck. Special acknowledgment was made by the Navy Department of the valuable services rendered in this connection.

On February 22, 1904, the schooner *Frank W. Howe* was observed by the North Head, Washington, station to be flying signals of distress. The observer promptly responded with

an encouraging message by flag signals, and notified the life-saving crew, who succeeded in saving seven of the vessel's crew out of nine. Vessel and cargo proved a total loss. Six days later distress signals were flown by the steam schooner *Grace Dollar*, when the same observer telegraphed for a tug, which was able to save both vessel and crew. The following is quoted from the *Oregon Journal*, of Portland, Oreg., in this connection.

Sailors plying up and down the coast have a true friend in Observer Kelliher, of the North Head weather station. During the past two weeks his "eternal vigilance" has been the means of saving a score or more of them from going down to watery graves. He was the first landsman to notice the helpless condition of the American schooner Frank W. Howe, and with admirable alacrity communicated the intelligence to the several life-saving stations, which immediately responded to the call. With the spirit of the true hero, at the risk of his own life and health, he joined in the work of rescue. Every man on board the doomed vessel was brought ashore in safety. A few days later the watchful observer discerned a small speck out upon the misty sea that did not look altogether right. With the aid of a telescope he discovered it was a steamer in distress. He apprised the tugboat captains and they went to the rescue. Later they returned with Grace Dollar in tow, and the alert Kelliher was again the direct means of saving life and property.

On June 6, 1904, the waterlogged schooner *Antelope* was sighted by the Southeast Farallon observer in great peril. Assistance from San Francisco was telegraphed for and arrived in the nick of time to save both vessel and crew.

PRINTING AND PUBLICATIONS.

The total number of copies, consisting of the regular publications of the Weather Bureau, together with books, bulletins, and miscellaneous pamphlets and forms, printed and disseminated during the year amounted to 46,229,853, of which 21,919,853, an increase of 1,919,853 copies over the preceding year, were printed in the office of the Bureau, as follows:

Daily Weather maps, 569,680; Monthly Weather Reviews, 57,600; Climate and Crop Bulletins, 151,567; Snow and Ice Bulletins, 31,216; station maps, 3,093,400; and miscellaneous books, pamphlets, meteorological charts and forms, 18,016,390.

The remainder of the work, mostly station maps and forecast cards, was performed at the Government Printing Office.

There have been no additions to or improvements in the plant since last report.

PERSONNEL OF THE BUREAU.

CLASSIFIED SERVICE.

APPOINTMENTS.—During the fiscal year appointments were made as follows: By original certification at salaries ranging from \$360 to \$1000 per annum, 48; by transfer at salaries from \$1000 to \$1250, 4; and by reinstatement at salaries from \$360 to \$1000, 4; total, 56.

TEMPORARY APPOINTMENTS.—There were 14 temporary appointments for periods from ten days to three months and at salaries from \$360 to \$720; 25 emergency appointments for periods from a week to thirty days and at salaries from \$450 to \$1250—all of which were made under the authority of the Civil Service Commission. Total appointments, all kinds, during the year, 95.

PROMOTIONS.—One hundred and thirty-one promotions were made, all but three being by advancement to the next higher grade. The exceptions were: One employee promoted from \$1600 to the position of librarian and climatologist at \$2000 because he was the only one between those grades qualified for the position. One was promoted from assistant observer at \$1000 to observer at \$1300 on account of his demonstrated fitness to fill the vacancy caused by the death of a section director, he being on duty as assistant at the station at which the vacancy occurred, and for months during the illness of the deceased having performed the latter's duties. The third was in the case of a messenger certified by the Civil Service Commission to fill a temporary vacancy at \$450 per annum. Coincidental with the termination of the \$450 vacancy another

occurred in the \$600 grade, to which this employee was promoted and in which he served a few days only.

REDUCTIONS.—The exigencies of the service (change of station, assignment requested by employees, or necessitated by the public needs) required eight reductions. In addition, three were made because of carelessness in the performance of important meteorological work, four because of physical disability, one because of frequent absences without authority and delaying payment of debts, two because of excessive use of intoxicants and neglect of duty, and one because of insubordination, making a total of nineteen for all causes.

RESIGNATIONS.—There were 44 voluntary separations from the Bureau, of which number nine were permitted for the purpose of enabling employees to accept appointments in other branches of the public service. Seven resignations were required as follows: Three for inefficiency, one for excessive use of drugs, one for inefficiency and marked personal uncleanness, one for nonpayment of debts, and one for delaying payment of debts and tardiness in reporting for duty. Total separations, 51.

REMOVALS.—Discharges were ordered in nine cases, for the following causes: Unsatisfactory service, four; intoxication and neglect of duty, one; insubordination and unsatisfactory service, two; intoxication and insubordination, one; untruthful statement as to cause of absence and neglect of duty, one.

DEATHS.—The total number of deaths was five. During the preceding year but two were recorded.

UNCLASSIFIED SERVICE.

Appointments to the unclassified service numbered nine (the salaries ranging from \$1.50 per diem to \$600 per annum), as follows: For duty at Washington, D. C., four (one through the Board of Labor Employment and three for temporary period of less than one month), for duty outside the District of Columbia, five (of which number four were appointed as temporary laborers at \$1.50 per diem and employed in road building in connection with the new station at Mount Weather, Va.).

Nine unclassified employees were promoted during the year, each promotion being made to the next higher grade, the salaries ranging from \$480 to \$720 per annum.

One unclassified employee was reduced, on account of change of station, at his own request. Eight voluntary resignations were accepted and one, a station agent, was necessitated by a change of the status of the station at which the agent was serving. But two unclassified employees were removed; one under strong suspicion of theft, and the other for obtaining leave of absence under false representation when his services were needed, and for absence without authority. No deaths occurred in the unclassified service.

ABSENCES DURING THE CALENDAR YEAR, 1903.

STATION.—The average absence of station employees, with pay, during the calendar year 1903, was 1.1 days on account of sickness and 10.5 days on account of annual leave. Ninety-nine per cent of the station employees being males, the matter of sex has been disregarded in figuring the average.

WASHINGTON, D. C.—The average absence, with pay, of employees at Washington, D. C. (clerks, mechanics, messengers, and laborers), during the same period was, males, 4.7 days on account of sickness and 27.1 days on account of annual leave; females, 6.7 days on account of sickness and 28.8 days on account of annual leave.

The general average of the entire service, station and Washington combined, was 2.1 days on account of sickness and 14.9 days on account of annual leave.

STATISTICS OF THE SERVICE.

The following tables show in compact form the numerical strength of the Bureau and the highest and lowest salaries paid in the classified and unclassified grades: